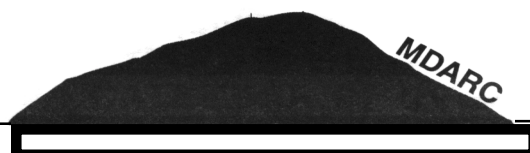


THE CARRIER

January 2001 www.mdarc.org www.pacificon.org



February Meeting
Friday February 16
7:30 PM

Soldering Techniques
Henry Schroeder, KF6PCE

Our Savior's Lutheran Church
1035 Carol Lane
Lafayette CA

What's inside

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Weekly Nets

Monday 8:00 PM SATERN Net Salvation Army 147.06
Tuesday 7:30 PM APRS 147.06 *
Thursday 7:30 PM Mt. Diablo Amateur Radio Club 147.06
*Planned
RACES Nets see page 2

President's Message

A couple weeks ago I returned from helping get my mother settled back at home after serious heart surgery. It's the same type my father had a few years ago. As one of their friends gave me a ride back to the airport, he told me how much he loved them and how both families take care of each other. This reminded me about our public service and community projects. Aren't we showing how we care about our fellow hams, and our community when we volunteer to help out the various non-profit groups. The community and the country would just not function as well, or be as unique as it is, without volunteers who care. Just like the many volunteers in a hospital, radio operators are a key ingredient in keeping things functioning. We may be unseen most of the time, but try to have things run without us!! So if you are not currently involved, or think your personal projects are always more important than those bike rides or runs that raise money and awareness of the people in really bad shape—think again. Get involved. It's what makes life rich and very meaningful. Come to the general meetings to find out what's coming up, and sign up. It's a most rewarding feeling to help people in need.

73,

Terry, KE6WRE

RACES Nets

every Thursday at 19:00 hours
Central County Jim Brunk N6BHX 145.680 /s
South County Ed Ritchie K6SFD 146.355 /+
100pl
East County Jim Tittle KC6SOE 146.535 /s
West County Rich Parker KD6JCT 145.110 /-

Cinderella Bicycle Ride Radio

Support Wanted

Once again, I have been asked to coordinate radio support for the Cinderella Bicycle ride on Saturday, March 31, 2001. The bike ride starts in Dublin, travels south around Pleasanton, heads east around Livermore, then north west towards Danville and back to Dublin. The mileage is approximately 65 miles. The ride is for women and girls only. The last several years, the ride has attracted 1700+ riders. This year will be the 25th anniversary of the ride. The radio support for this event is easy. The radio support is also being provided by Livermore Amateur Radio Klub (LARK), so this gives everyone a chance to interact with other clubs. There are 3 main checkpoints, a couple of locations where trouble can occur, a couple of amateurs at net control and the remainder of the amateurs ride 'shotgun' with support vehicles. Most of the communications can be done with a HT and rubber ducky or a mag-mount on the support vehicle. If you're interested or just want more information, please contact me. Thanks, Arnold Harding, KQ6DI 925-449-0966 or kq6di@home.com

February meeting speaker

Most kit failures are caused by poor soldering technique. Now is the time to learn how you should do it. Henry Schroeder, KF6PCE, will demonstrate "Soldering Techniques", including surface mount, wire-to-wire, PL 259 onto coax and through the board.

Special February Event

Come a few minutes early to the February meeting and take a look at another aspect of amateur radio. Mike Powell, N5GTF, will answer your questions about electronic kit building, or at least give you his somewhat opinionated view of it. As examples of the sorts of things you might choose to build, there will three or four, more or less completed projects, covering a wide range of complexity. If Ramsey Electronics and Hamtronics come through, there may even be some kit building catalogs to pass out.

ELECTRONIC CONSTRUCTION PROJECTS -- WHY BUILD?

Build something with a friend or family member to spend time with others. Build something to learn more about the technology in that fantastic radio you carry. Build something to experience the personal satisfaction of bringing a bit of technological magic into being. Build something with a non-MDARC member to get them interested in amateur radio. Build something for fun.

WHERE DO YOU FIND KITS OR IDEAS?

Ramsey Electronics (<http://www.ramseyelectronics.com>), Jameco Electronics (<http://www.jameco.com>), Vectronics (<http://www.vectronics.com>), and the Tucson Amateur Packet Radio Corp. (<http://www.tapr.org>) each have a selection of electronics kits of varying complexity and cost. If you want to try your hand at surface-mount assembly, take a look at the Nor-Cal QRP Club web site (<http://www.fix.net/~jparker/norcal.html>). The club is currently (1/2001) is selling a neat little surface-mount transceiver kit. Hamtronics (<http://www.hamtronics.com>) mostly sells assembled modules for integration into larger systems, but sells a few kits as well. The ARRL publications QST and QEX both present construction articles.

WHERE DO YOU FIND PARTS?

If you're building a kit, parts location isn't much of a problem. It's in the bag, so to speak. If you're building something from a magazine

article, finding the pieces might seem something of a barrier. It needn't. There's always that ol' standby, Radio Shack, but with the growth of the internet and e-commerce, a great many electronic suppliers and manufacturers have put their catalogs on line and accept on line or telephone orders with billing to a credit card. There are so many, it's almost a disservice to those not listed, but here goes anyway: Jameco Electronics (<http://www.jameco.com>), Mouser Electronics (<http://www.mouser.com>), Digikey (<http://www.digikey.com>), Future Electronics (<http://www.future.ca>) and Down East Microwave (<http://www.downeastmicrowave.com>), just to mention a few. Also, you will often find that the author has made arrangements with a third party to make and sell blank circuit boards for the project.

Don't forget swapmeets. There's a good one in Livermore on the first Sunday of every month at Las Positas College, North of I-580 at Airway Blvd. exit. 7 AM to noon, rain or shine. (I recommend getting there a little after 8 AM. This gives me a good hour to wander around and buy the really good stuff first.)

HOW ABOUT RESOURCES AND HELP?

One of the best, all around reference books is the ARRL Handbook. If you are building a project from a magazine article, sometimes you can get helpful hints from the author. Many give their email address in the article. A few go farther. They post follow-ups to their project on their web sites. I recommend taking a look at Steve Hageman's web site (<http://www.sonic.net/~shageman>) and at Wes Hayward's web site (<http://www.teleport.com/~w7zoi>) to see it done right. These guys have published articles for the ARRL, and both use their web sites to carry on very helpful interactions with builders. Also take a tour of the Nor-Cal QRP Club's web site (<http://www.fix.net/~jparker/norcal.html>). In particular look at the pictures of "The Manhattan Challenge". This will give you an idea of how to build RF circuitry without having to have PC boards.

And of course, there's MDARC. Ask someone.

Have Fun,

Mike, N5GTF

MDARC Board Meeting 1/8/2001

Greg Estep will be working on the Los Banos interference with 147.06.

Howard Burk will be working on APRS and packet. Possible speaker for meeting.

Possible speakers:

PG&E on disaster preparedness & electric safety

Jerry White's Motorola tape on static electricity

Dwayne Hendricks on software radios.

Leo KI6OY, Livermore on contesting

Tech committee, Keith on Voter receivers

Build a radio from scratch

Eric – kit builder QRP WA6HHQ

Norcal QRP club

Comments at the meeting:

Consider giving free membership badges

John Schulze is working on a program for the auction.

George needs help with greeters at the meeting.

Also need someone to handle soft drinks.

Motions at the meeting:

Motion to add 408 & 209 to valid area codes for autopatch: Approved.

Motion to write letter to W6IBD, Jim Davis to cease use of repeater: Approved.

Control Operators for Repeater

Howard Burk

Jay Caldis

Barry Winkler

Jim Brunk

Keith Lattin

Jim Tittle

Dick Schulze

Their phone numbers are available in the Club Directory.

ARLB002 ARRL Board Approves Dues Increase, Alters Morse Position

Meeting in Irving, Texas, January 19 and 20, the ARRL Board of Directors voted to increase membership dues from \$34 to \$39 annually for full members younger than 65, and from \$28 to \$34 for full members 65 and older. The dues hike goes into effect July 1, 2001. The last ARRL dues increase was in July 1997. The dues increase resulted from a need to fund initiatives to expand the League's advocacy activities on behalf of Amateur Radio—including the defense of amateur spectrum—and to enhance ARRL Headquarters' abilities to serve members during a period of projected deficits. The Board okayed a \$1 greater increase for seniors in an effort to narrow the dues gap, as more and more ARRL members fall into the senior category.

At the same time, the Board approved the hiring of development and sales and marketing professionals on the Headquarters staff as part of an overall plan to augment revenues. "The ARRL carries out a lot of activities that no longer can be fully funded by dues or publication sales revenues," ARRL Executive Vice President David Sumner, K1ZZ, explained. While voluntary contributions towards Amateur Radio advocacy are helping greatly, "we need to professionalize these activities if we are going to sustain them," he said. The Board also revised its position on whether Morse code proficiency should continue to be an international requirement to license operation below 30 MHz. The Board approved a resolution that "recognizes and accepts" that the Morse requirement likely will be dropped from Article S25 of the international Radio Regulations at the 2003 World Radiocommunication Conference. But the Board held the line on retaining a domestic Morse requirement, saying that each country should be allowed to determine for itself whether it wants to have a Morse code requirement. The Board's Morse Code resolution declared that deletion of the Article S25 international requirement at WRC-03 "should not automatically or immediately mean a similar removal of the Morse code from Part 97 of the FCC rules." Morse code, the Board affirmed,

deserves continued support as an important operating mode as well as in terms of spectrum and "should be retained as a testing element in the US." The resolution also called on ARRL Headquarters staff to "develop a program designed to promote the use of Morse." The resolution supersedes all previous Board policy statements regarding Morse code and Article S25.

The Board has adjusted the management structure at ARRL Headquarters. Publications Manager and QST Editor Mark Wilson, K1RO, will serve as the ARRL's Chief Operating Officer. In that position, Wilson will oversee sales and marketing, publications, field volunteer and membership services, the ARRL Lab, and other day-to-day Headquarters activities. The Board also established a committee to solicit membership input to update the ARRL's position on refarming the HF Novice bands "in light of the 1999 FCC license restructuring Report and Order." The five-member panel will be named by President Haynie. It will report to the board in one year.

W6CX Awards for 2000

Here are the ones that were announced at the January meeting

Ron Luttringer K6XC
Paul Howes WA6GY
Daniel Bent KF6IQL
Wayne Merryman WB6WZV
Previously announced awards
Harry Styron K6HS
Marie Lewis KF6GLV
Ham of the Year
John Schulze KR6CR
Kilroy Key
Howard Burk KE6PTT

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The Incredible Inedible Dipole

L. B. Cebik, W4RNL

We call it a "dipole," but that is only shorthand. Its real name is "the resonant half-wavelength center-fed dipole." No wonder we shorten the name. Unfortunately, by forgetting the full name, we also end up forgetting the basic properties of amateur radio's most basic antenna.

So let's start again, looking at each of the elements in the antenna's name and seeing what we can discover about the dipole. Often maligned as too simple to be much good, the dipole turns out to be a rather fantastic antenna.

Now here is how the full name works:

1. Dipole: the antenna is a dipole because it has two "poles," that is, regions of the antenna where the current goes from maximum to minimum.
2. Center fed: The antenna is fed at its exact center.
3. Half-wavelength: the antenna is approximately 1/2 wavelength long.
4. Resonant: the feedpoint impedance, Z , which is ordinarily composed of resistive and reactive components ($R \pm jX$), is purely resistive.

In addition, everyone knows how to calculate the length of our resonant half-wavelength center-fed dipole: L (in feet) is the length figured according to a simple recipe(1):

And everyone also knows that the feedpoint impedance of a resonant dipole is about 70 to 72 ohms. All we have to do to put up a dipole for 7.15 MHz is to apply the formula and cut our wire to a length of 65' 5.5" and hang it up.

First, the formula is only a ball park generalization, and not very accurate at that. Even in free space (a presumed volume in which the antenna is centered with absolutely nothing reflective in any direction), the formula does not match up well with NEC-2 models. Using #14 copper wire, the length of a free space dipole for 7.15 MHz is 66.95' and its feedpoint impedance is 73.6 ohms.

Second, the formula(1) is shorthand for a more accurate equation(2):

$$L(\text{feet}) = \frac{468}{f(\text{MHz})} \quad (1)$$

$$L(\text{feet}) = \frac{492 \times K}{f(\text{MHz})} \quad (2)$$

where K is a shortening factor due to what some treat as capacitance off the ends of the wire elements. The standard formula assumes a value for K of 0.95.

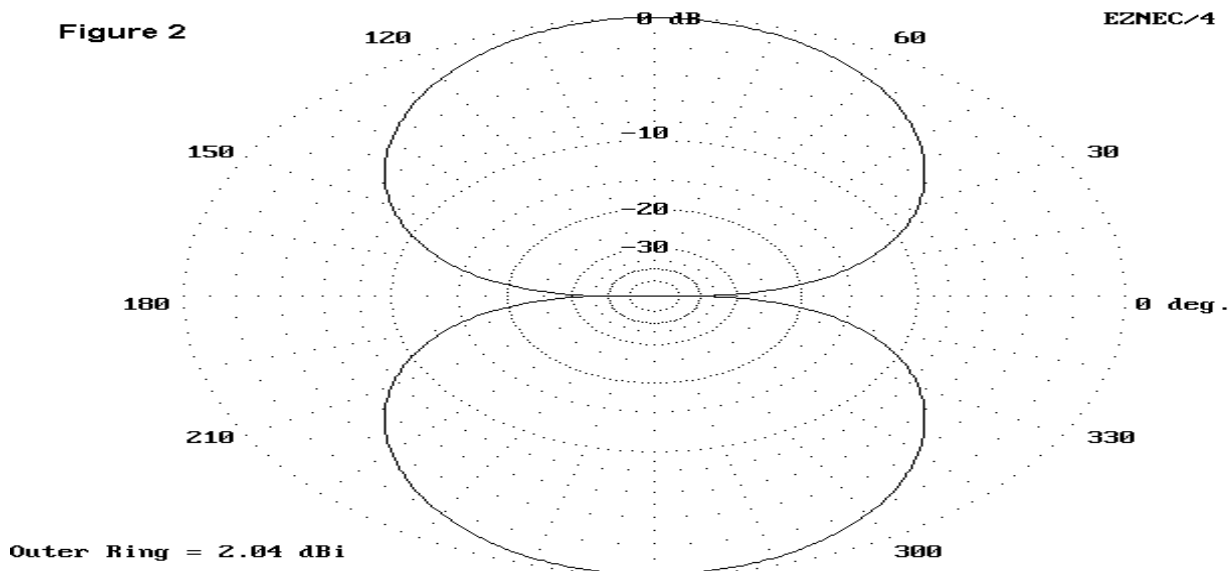
Values of K appear in handbooks as graphs, the origin of which no one currently remembers. These graphs and the presumed figure of 0.95 are once more ball park numbers. For a more correct readout of values of K , see "Calibrating K to NEC," QEX, March, 1996, pp. 3-8, or HAMCALC.

K varies with the wire size: the larger the diameter, the lower the value of K . It also varies in a minor way according to antenna material, with higher loss material showing a lower value of K . No single value can capture every wire size used by antenna builders. We can construct with spreads of wires effective diameters up to a foot or more. By comparison, #12 AWG wire is 0.0808" in diameter.

While we are focused on wire diameter, we might also note that fatter wires also increase the bandwidth of a dipole. We tend to define bandwidth in terms of SWR. An antenna's bandwidth might be said to be the frequency spread between those frequencies at which the antenna shows a 2:1 SWR relative to its natural resonant impedance. Changing wire size from #34 at the thinnest end of the line to about 2" at the upper end results in an increase in bandwidth of over 2 to 1. For other comparisons, see the Bandwidth program in HAMCALC.

Real Dipoles

None of us (non-astronauts) gets to put up an antenna in free space. But, just for the record, here is the azimuth pattern for our 40-meter dipole in free space.



You may think that the gain in dBi of this NEC-2 model is too low, for we have all been told that a dipole's gain in free space is about 2.15 dBi. However, #14 copper wire has some (small) loss, which the model incorporates.

Unfortunately, from 160 meters to 30 meters, our antennas are usually less than 1/2 wavelength in height. Therefore, the real dipoles with which we operate show considerably different traits from our free space model. The Sommerfeld-Norton ground calculation system permits accurate models of low antennas, with the limitation that the antenna is modeled over level ground free of the ground clutter of real ham installations.

At heights below 1/2 wavelength, the resonant length of an antenna will vary considerably from the free space length. (By way of contrast, the fluctuations of all properties of antennas above 1/2 will grow much smaller, reaching relatively insignificant proportions for most, but not all, types of antennas above 2 wavelengths. See "The Effects of Height on Other Antenna Properties," Communications Quarterly, Fall, 1992, pp. 57-79.)

MDARC Board of Directors

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CALENDAR OF EVENTS

2/05/2001	7:30 PM	MDARC Board meeting	Emil Villa's in Concord
2/16/2001	7:30 PM	MDARC General meeting	
2/17/2001	8:00 AM	PACIFICON General meeting	
2/23/2001		Carrier Deadline	
3/05/2001	7:30 PM	MDARC Board meeting	Emil Villa's in Concord
3/16/2001	7:30 PM	MDARC General meeting	
3/27/2001	8:00 AM	PACIFICON General meeting	
3/30/2001		Carrier Deadline	

MDARC Repeaters

147.060 MHz + / PL 100 Hz	ATV: Input 1253.250 MHz
224.780 MHz - / PL 77 Hz	ATV: Output 427.250 MHz Cable Channel 58
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The Carrier
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